

*Virginia  
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# Virginia Wildlife

*A Monthly Magazine Dedicated to the  
Conservation, Restoration, and Wise Use of  
Virginia's Wildlife and Related Natural Resources,  
and to the Betterment of Hunting, Fishing and  
Outdoor Recreation in Virginia*

*Published by VIRGINIA COMMISSION OF GAME AND INLAND FISHERIES, Richmond 13, Virginia*



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**COVER:** The glossy ibis is usually thought of as a Florida resident, but does appear in small numbers on Virginia's Eastern Shore. It nests over water in low trees, shrubs, or beds of reeds, and feeds on crayfish, grasshoppers, small snakes, insect grubs, and leeches. Photo by Allen D. Cruickshank from National Audubon Society.

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## EDITORIAL

# Our Vanishing Wetlands

ONE of the big problems of the day in wildlife conservation is that of safeguarding our natural aquatic environments. Such areas as marshes, swamps, open shallow waters, and seasonally flooded lands, collectively known as wetlands, provide much of the homeland of our wildlife—areas we must protect if the battle for American wildlife is to be held and won.

More than 100 years of exploitation have taught us many lessons in the use and abuse of wetlands. The Swamp Land Acts of the middle 1800's paved the way for transferring nearly 65,000,000 acres of wetlands in 15 states from federal to state control for the purpose of drainage. Practically all of this land is now in private ownership. Wildlife use on these lost areas is said to be minor. According to a recent U. S. Fish and Wildlife Service report, at least 45,000,000 of the original 127,000,000 acres of wetlands have been drained or otherwise destroyed. Agricultural drainage and flooding have been the two largest factors responsible for this loss, but other activities such as canal and highway construction, industrial and home development, and mosquito control have also been serious contributors. The inroads on wildlife habitat have been greatest in the coastal states. Virginia, with her extensive tidelands, has had more than her share of loss.

With more than half of America's original wetlands gone and with the human population spiraling upward beyond the 180,000,000 mark, soon to reach 200,000,000, it seems certain to wildlife conservationists almost everywhere that the wildlife battle will be won or lost on the wetlands battle line.

Take the sub-issue of waterfowl alone. The feeling here is that if we don't save our remaining marshes and other wetlands during the remainder of this century—only 40 short years—we might as well say good-bye to our ducks and geese. An important tenet that all must remember here is that a well integrated system of state and federal public refuges and shooting areas all over America is absolutely necessary if waterfowl and waterfowling are to have a place in America's future. Further loss of marsh country can only add to the present plight of waterfowl.

Wetlands, however, have values other than just as habitat for waterfowl, and these are important, too. The use of wetlands by such interesting and valuable furbearers as the mink, muskrat, beaver, raccoon, and otter is common knowledge. Important, too, but less well-known is the fact that many species of small game as well as big game utilize the marshes and swamps in their seasonal requirements.

Altogether some 50 fur and game species of wildlife look to the marshes and swamps for their food, water, and necessary cover. Some birds such as the rails, the peregrine falcon, osprey, and the American bald eagle could not live were it not for the marshes.

Moreover, our marshes and swamps have values other than for providing habitat for wildlife. Wetlands have special societal values for man—values that have esthetic and spiritual meaning—and these may be most important. When the marshes and other wetlands go, so will their power to inspire men's hearts or heal

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## LETTERS

### Don't Condemn the Archer

I READ with special interest the articles "Why Do You Hunt and Fish" and "A Man and His Gun" in the February VIRGINIA WILDLIFE.

The unfavorable comments and articles directed towards bow hunting in some other publications recently warrant a reply similar to yours concerning unfavorable comments towards guns, *i.e.*, don't condemn the bow and arrow but the persons who use them improperly. I have spent too many delightful days of hunting with both gun and rod to see their value and enjoyment for others restricted by the few who use them improperly.

James S. Hickson  
Richmond, Virginia

### Provision of Food for Wildlife Necessary

I WISH to congratulate you on your excellent magazine, VIRGINIA WILDLIFE, which, contributes so much to conservation in Virginia.

For several years now, I have been giving, through local game wardens, 25 subscriptions to the magazine to be sent to boys and young men who are interested in conservation measures, particularly in planting for quail and other game birds. With existing farm conditions, unless this is done, we cannot hope to preserve even our present supply of game.

C. O'Connor Goolrick  
Fredericksburg, Virginia

### Report of Tree-Roosting Quail

IN your Questions and Answers section I noticed the question, "Will quail ever take to trees?"

During the 1920's I enjoyed a great deal of fine bird hunting here in Northumberland County. There was one flock estimated at more than 30 quail which fed along the edge of a stand of large pines. These birds would invariably flush before my dogs got within 50 yards of them, and they invariably took to the tops of those tall pines. I do not think the birds paired off and nested. The flock finally disappeared.

T. Boyd Taliaferro  
Heathsville, Virginia

### "Branta" Called Fine Tribute

WE read with much pleasure your "Branta Goes Home" article in the March issue of VIRGINIA WILDLIFE.

Approximately a half century ago, one of the finest sportsmen it was my good fortune to know and I were listening to some wild geese calling. He said, "Brooks, when the honk of a wild goose does not make your pulse beat a little faster, you are getting old, my son, you are getting old." The writer is glad to say that, measured by this yardstick, he is still young in spite of his 72 years.

You paid what impressed me as the finest tribute I have ever read to the grandest bird that flies.

J. Brooks Mapp  
Keller, Virginia



# Where We Stand Today in Conservation

By SETH GORDON

*Vice President, North American Wildlife Foundation  
Sacramento, California*

CONSERVATIONISTS as a group, and that includes administrators, have been notorious for their failure to "read the sign posts along the way," to study the record left by those who trod the same trails. Thus we have tended to repeat, over and over, the same foolhardy blunders.

So that we may evaluate "Where We Stand Today in Conservation," let's review the record of these and related conferences.

It is generally agreed that in North America President Theodore Roosevelt's conference with the governors of the United States at the White House (May 13, 1908), and his many official actions, were the kick-off for organized public conservation programs as we know them today. He told that first conference that:

"The question of the conservation and use of the great fundamental sources of the wealth of this Nation is the chief material question that confronts us, second only to the great fundamental question of morality."

Roosevelt appointed a National Conservation Commission to inventory the resources in question, and a Conservation Congress was held in December of the same year, followed by a North American Conservation Conference in February 1909—just before Teddy retired from the White House.

These conferences were held under official auspices, and included primarily high government and state officials.

Other natural resource conferences, held under civilian auspices mostly, soon followed. One series of five was called the National Conservation Congress.

The first of these conferences was held in Seattle, Washington, August 26-28, 1909. As one speaker at the opening session put it, this was "not a convention of officialdom, but a congress of the people." The arrangements were handled by the Washington Conservation Association.

Practically all of the states were represented, as was British Columbia. One might say, therefore, that this may well have been the beginning of the international co-operative approach in conservation matters.

The theme of those five National Conservation Congresses was: "Let Us Conserve the Foundations of Our Prosperity." Sounds familiar, a half century later, doesn't it?

While the major discussions dealt with industry and economics, and included such topics as forest conservation and the harnessing of rivers, the addresses also covered water pollution, soil erosion, fisheries conservation, game protection, migratory birds, and numerous other topics we discuss today. Recreation as such was scarcely mentioned.

Other than foresters, led by Gifford Pinchot, technically trained workers in the conservation field then were unknown or unheralded.

The last of these National Conservation Congresses was held at Washington, D. C., in 1913, and, according to the record, attracted 1,400 delegates.

While we call this the 25th North American Wildlife and Natural Resources Conference, it is in reality the 45th of a chain of conferences, divided into two series, and continuous with the exception of the war year of 1945.

The first series of 21 conferences was held in New York City, under the auspices of the American Game Association. The second series of conferences has been sponsored by the American Wildlife Institute, organized 1935, and its successor, the Wildlife Management Institute.

During the early days of the American Game Conference, technicians in the wildlife and fisheries field were a scarce commodity. Several university professors who undertook special studies regularly attended to report their findings. Sometimes they brought a promising student along.

It was not until the 18th Conference (1931) that Dr. Arthur A. Allen of Cornell University assembled a handful of college-trained wildlife specialists in a comparatively small hotel bedroom "to talk shop."

This led to the three-day sessions we have long known, and the 19th Conference had its first special sessions on wildlife research. The attendance of technicians was very small, but administrators and others present quickly realized the need for trained fish and game men to collect basic information.

The first 21 conferences either initiated, or aggressively supported, some of the outstanding game and fish restoration programs and policies in vogue today.

Only a few of these can be mentioned, but among them were:

- The 1916 Treaty with Canada to protect migratory birds.
- The Migratory Bird Treaty Act of 1918, to give the treaty effect.
- "The American Sportsmen's Platform," a comprehensive declaration of principles, adopted by the 1924 conference.
- The Federal Waterfowl Refuge System, started 1920, enacted 1929 without the revenue and hunting grounds features recommended by the conferences.
- The American Game Policy, adopted by the 1930 conference.
- The Duck Stamp Law, to finance the federal waterfowl refuge system, regularly pushed by the conferences.

Address to the 25th North American Wildlife and Natural Resources Conference, Dallas, Texas, March 7-9, 1960.

enacted 1934, without the hunting grounds feature of the original bill.

- Federal Coordination Act, 1934.
- The Pittman-Robertson Federal-Aid Program, enacted 1938, was initiated in 1939, as an alternate proposal for the Duck Stamp.

At this point one should mention another series of conferences, started in 1924, concluded in 1928, because many of the active conservation workers today never heard of them.

President Calvin Coolidge appointed a committee of five cabinet members, headed by the Secretary of War, to plan a National Conference on Outdoor Recreation. Colonel Theodore Roosevelt, then assistant secretary of Commerce, was designated as executive chairman.

The purpose, as set forth in a report to Chairman Weeks, was:

"The attainment of a balanced system of national economy . . . that will adequately provide for an optimum population . . . without lowering accepted standards of living . . . Outdoor recreation is the most wholesome expression of leisure and a needful social force. . ."

The first of these conferences was held in Washington, D. C., May 22-24, 1924, with 309 delegates representing 28 national organizations. The initial conference adopted 15 resolutions. They covered such widely diverse subjects as federal land policies, forest research and the relation of wildlife and recreation to forestry, wilderness areas, refuges for wildlife, water pollution and drainage damage, and protection of migratory birds. Some of the recommendations were shortly enacted into law.

Evolutionary processes are always at work at these conferences. Long before the first series of 21 conferences had been completed there was widespread demand for steps which would elevate fact-finding, planning, and administration of fish and wildlife to the same professional levels as forestry and agriculture.

Except for a few colleges and universities, there were no opportunities for men to obtain training in modern fish and game survey and management techniques.

When Ding Darling, a layman and ex-fish and game commissioner of Iowa, became head of the U. S. Biological Survey in March of 1934, he decided to help do something about the deplorable shortage of trained men working at the state level.

After casting around for months he proudly announced during the summer of 1935 that an "angel" had been found to put up \$30,000 annually through the newly organized American Wildlife Institute (now the Wildlife Management Institute); that the Biological Survey would provide \$42,000 annually; that certain game departments would be willing to match the Institute's contribution; and that state land-grant colleges or universities would provide facilities, etc., "to do research in wildlife subjects as well as in teaching the application of modern game-management methods." Ten projects were planned.

The response was magnetic. Virginia's Cooperative Wildlife Research Unit got off first, followed by Iowa, Oregon, Connecticut, Alabama, Utah, Texas and Maine,

all underway by the end of 1935.

Since that time ten more units were added; one of the original units was disbanded, and one was taken over entirely by the state. Today there are 16 cooperative units functioning, and the one maintained by a state.

Is there any danger of an oversupply of well trained fish and wildlife graduates? The answer is, Definitely not!

In the beginning there was some fear that more men than needed were being graduated from specialized courses in fish and wildlife management. Fortunately, the Pittman-Robertson Program (1938) went into operation just in time to absorb the additional graduates, and the Dingell-Johnson Program (1950) came along in time to give fisheries trainees ample opportunity for employment.

The vast majority of the fish and wildlife graduates are in such work today. They are employed by state and federal agencies, teaching in colleges and universities, or working in closely allied fields. Many of them have attained high and influential positions in their chosen profession.

These trained workers are bringing their findings to these conferences in increasing numbers annually, which assures a still brighter future for the North American Wildlife and Natural Resources Conference.

I trust the summary of conference highlights prior to 1936, plus the supplemental information on the Cooperative Wildlife Research Units and the part they have played, will provide a glimpse of the major passing events.

President Franklin Roosevelt was induced to issue the call for the first North American Wildlife Conference, Washington, D. C., February 3-7, 1936, to give the entire field of natural resource conservation new impetus.

That conference attracted interested workers from all parts of the three countries (Canada, Mexico, and the United States), from every organization known to have an interest in the conservation of all natural resources, especially forests, waters, soils, and fish and wildlife.

The conference ran for five days, one of which was devoted to planning the organization of the National Wildlife Federation, with the thought of having a central clearing-house for all of the local organizations throughout the country interested in the broad field under discussion.

This was the greatest public forum of its kind that had ever been held in North America. It was a conference in which no commitments were made, other than to give birth to the National Wildlife Federation.

The history of the past 24 conferences is pretty well-known to most of you here present. The record of progress is a most impressive one.

By moving the conferences to various regions of the United States and Canada it has been possible for many more people to attend them, and to get the necessary information and inspiration with which to make a mass assault upon the problems in hand.

It has been a quarter century of progress, of understanding, of cooperation. Many of the problems which confronted us 25 years ago have been solved, or are on the way to solution.

Largely due to the impact of these annual conferences, and the opportunity for those in attendance to obtain the

(Continued on page 11)



## Virginia's Game Birds

THE Virginia game, inland fish and dog code defines this state's *nonmigratory* game birds as grouse, bob-white quail, ring-necked pheasant, wild turkey, and birds introduced by the Commission of Game and Inland Fisheries, and its *migratory* game birds as doves, ducks, brant, geese, swan, coot, gallinules, sora and other rails, plovers, snipe, woodcock, and yellowlegs. The appearance and habits of all of these birds except the swan, plovers, and yellowlegs—classed as game birds but protected for many years by closed seasons—are covered briefly here.

### Forest Game

#### Ruffed Grouse (*Bonasa umbellus*)

Commonly referred to as “pheasant” in Virginia and “partridge” in the North, this medium-sized, chicken-like bird that frequents hardwood forests and forest openings was formerly abundant all over the state except possibly the southeastern counties, but is now generally restricted to the mountain areas. Its habit of bursting out from under the feet of hunters and sailing with a roar through the treetops at breakneck speed makes it a favorite upland game bird, and it is excellent eating.

The brown and gray colors of the grouse blend well with the dead leaves of the forest. The fan-shaped tail of the 16- to 19-inch-long bird has a black band near its tip.

The grouse nests (April-July) in a hollow on the ground lined with leaves and produces from 8 to 15 whitish to pale brown eggs which hatch after about 24 days into precocial young. The chestnut-buff-colored chicks follow the female in a flock until they are able to shift for themselves.

The grouse is particularly known for its “drumming.” Drumming is performed by the rapidly beating wings of the male usually during the mating season, but it can be heard almost the year round. It is the love call of the male grouse, and is usually given on some old fallen log, deep in the woods, as the bird struts like a turkey gobbler with spread tail and drooping wings.

The grouse feeds on buds, leaves, and berries, and will eat insects when they are available. It is hardy, and can subsist on twigs and dead leaves.

Principal grouse nest predators are skunks, foxes, black snakes, weasels, and raccoons. Late spring forest fires can also destroy many nests. Great horned owls and Cooper's hawks may take some chicks as well as mature roosting grouse.

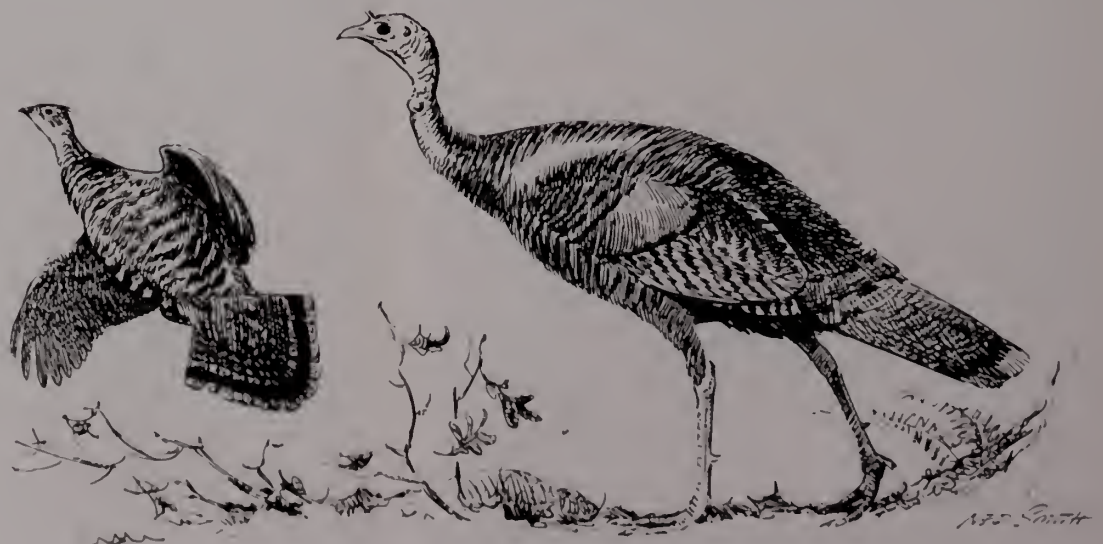
#### Wild Turkey (*Meleagris gallopavo*)

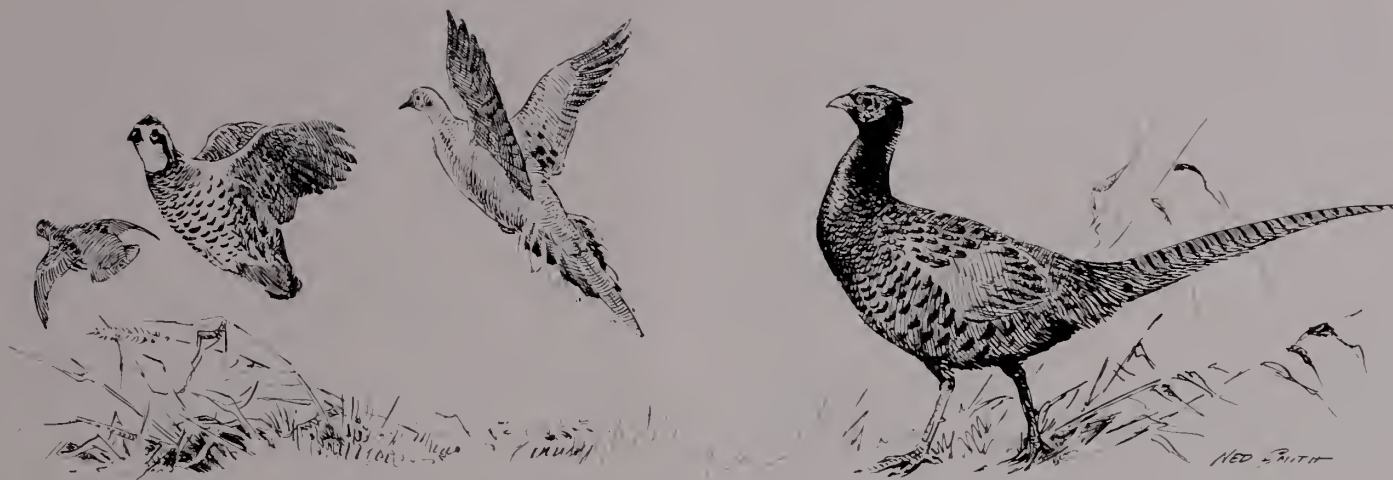
The wild turkey is our largest (to 48 inches and 20 pounds) and most prized upland game bird. Similar in its bronze-hued appearance to the domestic bird, the native wild turkey is slimmer and has brown (not white) tail tips. Despite its pompous appearance and habit of strutting, it is shy and wary, seeking the protection of extensive mature forests and finding its food of acorns, seeds, berries, and insects in the more open wooded areas.

This valuable and beautiful game bird has continued to exist in some numbers throughout the Commonwealth since the first permanent settlement at Jamestown in 1607. It is estimated, however, that the wild turkey now occupies only 28 percent of its original range in the United States, and at one time had disappeared from all but 34 percent of its original range in Virginia.

The wild turkey's comeback in the Old Dominion has been due in part to the game commission's program of releasing wild-trapped as well as game farm-reared turkeys in areas of suitable habitat, especially in southwestern Virginia. The birds have been restored to at least 66 of Virginia's 98 counties, and between 3,000 and 4,000 wild turkeys are killed by hunters here each year. The wild turkey begins breeding in late March, with old toms attracting a harem of up to 10 (usually 5 or 6) hens. Yearling toms are not capable of breeding. The hens start egg-laying (in a lined depression in the ground) and incubation in late March, April and May, and hatch their 8 to 20 (usually 10) buffy-white to yellowish buff eggs in 28 days.

Virginia's native forest game birds are the ruffed grouse (at left) and the wild turkey. Not shown is the Reeves pheasant, an exotic woodland game bird being propagated at the commission's game farm for experimental release in southwestern Virginia.





Farm game birds (left to right): bobwhite, mourning dove, Iranian black-necked pheasant. (Pheasants are being experimentally stocked and are protected by a closed season.)

The precocial young are able to fly well enough at 4 weeks to start roosting in trees.

Turkey flocks roost in clumps of conifers and range over some 4 or 5 square miles daily in search for food and water. They are fast runners (15 m.p.h.) and strong fliers.

Free-running dogs and hogs, as well as skunks and crows, destroy some turkey eggs, but older birds are relatively safe from attack by dogs and bobcats under most circumstances.

## Farm Game

### Bobwhite (*Colinus virginianus*)

Of all game birds, the whistling bobwhite is the most familiar. A small chunky reddish-brown bird with a distinctive head pattern and a dark grayish tail, it averages 10 inches in length and 7 ounces in weight.

Totally beneficial to man over its wide range, the quail is a highly prized dweller of our hedgerows, wood margins, and brushy fields.

The species was not abundant when Indians roamed early Virginia; the white man was responsible for the spread of the quail. During those early days of mule-drawn plows, rail fences and crude methods of farming, the bobwhite increased in the weedy fields and overgrown fencerows. Today, however, the mule has been replaced by the tractor, the rail fence by barbed wire, and scarcely a blade of grass is left uncut or a foot of sod unturned. Under such conditions, the bobwhite's numbers have been reduced.

Various methods of increasing the numbers of quail have been tried. The first quail farm in North America was established in Virginia in 1920, and game farm-reared quail have been stocked here each year until very recently. However, the belief now is that the only sound approach is to permit nature to raise wild birds by providing proper food, cover and protection.

The bobwhite is monogamous. Both parents share the responsibility of the brood, and if one of them meets with misfortune the other takes charge of rearing the young.

In Virginia, the breeding season may begin as early as February. The first "bobwhite" whistle of spring is a sign that the mating season has arrived. An average of 14

eggs is laid per nest, and incubation lasts 23 days. The brood of 7 to 14 young hatches in late May or early June.

The chicks develop rapidly, and at 2 weeks of age they begin to flush and fly for a short distance. By the time they are 2 months old they are able to flush with considerable speed and fly rapidly to distant cover. The young reach maturity at the age of 13 weeks and, with the exception of juvenile feathers, can hardly be distinguished from their elders.

After the summer nesting season, quail are found in good cover in coveys of up to 30 birds which hold tight to a dog until, at the last minute, they burst forth and scatter in all directions.

### True Pheasants (Genus *Phasianus*)

The ring-necked pheasant (*Phasianus colchicus torquatus*), a native of southeastern and eastern China and first introduced into the United States in 1880, is now found throughout northern United States but, despite repeated stocking attempts, has never become established in Virginia.

Virginia may have huntable pheasant populations in the future, however, as a result of a cooperative foreign game introduction program now underway. Since 1958 the Virginia Commission of Game and Inland Fisheries has raised at its Cumberland State Game Farm thousands of several different strains and crosses of the black-necked pheasants (*Phasianus colchicus talischensis* and *P. c. persicus*) which are native to Iran's Caspian seacoast. Brood stock was obtained through the U. S. Fish and Wildlife Service. Releases of pure strain birds and blackneck-ringneck crosses are being made in a number of suitable Tidewater and Piedmont locations, and biologists are encouraged at the way these birds have reproduced and become locally established. Releases will continue, as will a closed hunting season, until the pheasants are well distributed and in no danger of being exterminated by an open season.

The black-necked pheasant weighs 1½-2½ pounds and resembles the ringneck except that the cock lacks the characteristic white neck ring. (Cocks of the blackneck-ringneck crosses often have the white ring, however.) Its head is iridescent green, and its body plumage coppery-brown. The hen is brownish, but can be distinguished from a grouse by its long, tapering tail.



Pheasants usually thrive best in grain-growing farm country, where there is abundant waste grain, seeds, and berries for food, and where they can find shelter in dense, coarse herbs or shrubbery.

In spring the winter flocks break up, and the cocks scatter out to take up individual crowing territories within which the 1 to 10 hens with which the cock mates build their nests. Nests are built on the ground in hay or grain fields or other cover. The 6 to 12 olive-brown eggs are laid over about a 14-day period. The incubation period is 23-24 days.

Pheasants reared in the wild are usually capable of caring for themselves, but are preyed on by foxes, skunks, great horned owls, Cooper's hawks, crows, and house cats.

#### Mourning Dove (*Zenaidura macroura*)

Quite abundant throughout most of Virginia but less common in the extreme southwestern and eastern counties of the state, the mourning dove is Virginia's only wild member of the pigeon family. It is about 12 inches long, with long, pointed wings, brown head, buffy gray body, and a long, white-edged, pointed tail.

A game bird that has a large and growing number of sportsmen followers, it is mainly migratory and arrives in Virginia in March, remaining until November. A few, however, stay around all year. Its habitat is open woodlands, farmlands, suburbs, and roadsides, where it feeds on weed seeds and waste grains. The mournful call (*coo-ah, coo, coo*) of the bird is sufficient warrant for its common name.

The dove's nesting season extends from March until October; 2 or more broods may be raised during this time. The dove lays two white eggs, rarely three, in a flimsy, flat platform nest of sticks lined with finer material usually located 15-25 feet above the ground in an isolated tree. It feeds its young a secretion from glands in the crop, which is pumped into the mouths of the young in liquid form, called "pigeon milk."

Blue jays, brown thrashers, crows, tree squirrels, flying squirrels, and snakes prey on dove eggs and young, and Cooper's hawks are known to take adult birds.

## Wetlands Game

### Canada Goose (*Branta canadensis*)

Best known of our geese, the Canada goose is our only goose with a white "chin strap." It is brownish-gray above, its head, neck, and tail are black, and the base of its black "stocking" neck is clearly defined against whitish underparts. Measuring 22-43 inches long, it has a wingspread of between 5 and 6 feet, with weights reported up to 16 pounds but averaging around 8 to 10 pounds.

Because of its wariness, size, powerful flights, honking call, and the fact that it mates for life, it has fascinated sportsmen for centuries. It breeds primarily along the Arctic coast. Its nest is generally a flat mound of grasses on a foundation of sticks on the ground. The normal clutch is 5 creamy-white eggs. In fall and winter, great concentrations are found along Virginia's large tidal rivers and estuaries and on Back Bay. Fortunately, the continental Canada goose population has held its own in recent years while duck populations have declined.

The Canada goose is largely a vegetarian, feeding mostly on grasses, grains, and aquatic vegetation, although it will eat insects, earthworms, clams, and other shellfish.

Thousands of snow geese and lesser numbers of brant and blue geese also winter in Virginia waters.

### Black Duck (*Anas rubripes*)

Virginia's most common duck and the most important species on the Atlantic Coast, the black duck is a typical representative of the dabbling duck tribe which also includes, in Virginia, the mallard, gadwall, baldpate, pintail, green-winged and blue-winged teals, and shoveller.

The sexes are quite similar, dark sooty-brown with white wing linings in flight. The average weight of the black duck is 3 pounds, similar to that of the colorful mallard, and its average length is 23 inches. It frequents nearly all of the watercourses in Virginia, but is most numerous in our eastern freshwater and brackish marshes. It is a tip-up or surface feeding duck, fond of grasses, pondweeds, sedges, mollusks, and crustaceans.

The black duck lays from 6 to 12 creamy to greenish eggs

Wetlands game (left to right): clapper rail, sora, Canada goose, canvasback, black duck (in flight), coot.





on the ground in well-concealed marsh locations. It breeds from northern Labrador south to coastal North Carolina, and as far west as Minnesota and northern Illinois. In the winter it is at home from Maine to northern Ohio, and southward to Florida, Louisiana and the Texas coast.

### **Wood Duck (*Aix sponsa*)**

The colorful wood duck, which breeds in forest-bordered freshwater marshes, swamps, and creeks throughout Virginia, is our only surface-feeding duck with a crest. About 18 inches long, the male is boldly patterned with iridescent maroon, green, purple, and white. The female has a grey, crested head with white eyering, throat, and underparts and grey-brown back.

In its nest, generally located in a natural hollow in the trunk or rotted-out limb of an old tree, from a few feet to 50 feet above the ground, 10-15 white eggs are laid. They are incubated 28-31 days by the female only.

Acorns and other tree seeds, together with duckweed, sedges, pondweeds and other aquatics and a few aquatic insects, make up the wood duck's diet.

Wood duck eggs are devoured by raccoons, fox squirrels and opossums and their shells are punctured by woodpeckers and starlings.

### **Canvasback (*Aythya valisneria*)**

The lordly canvasback, "pride of the Chesapeake," is a member of the diving duck tribe also represented in Virginia during the fall and winter months by the redhead, ring-necked duck, greater and lesser scaup ducks, American goldeneye, bufflehead, and ruddy duck.

About 21 inches long, this bird may be identified by its long, sloping profile. The male has a white back; the female's head and breast are light brown and its back is grayish.

The canvasback, like the redhead and the ruddy duck, has been reduced in numbers in recent years partly because of drainage and drought in the prairie and intermountain regions of North America where it nests in emergent vegetation along the shallow marshy borders of small "potholes." The 6 to 13 pale green eggs are incubated, by the female only, for 23-29 days.

It eats roots, tubers, and aquatic plants, notably pondweeds and wild celery.

### **Rails, Gallinules, and Coots (Family *Rallidae*)**

Members of this family are somewhat chickenlike. They seldom fly far except on migration.

The clapper rail is a long-billed bird about 14 inches in length and weighing from 12 to 15 ounces. It is gray and buffy in shade, and is rarely seen away from our saltwater coastal marshes. (The somewhat similar king rail is browner, and is found in freshwater marshes.)

It is a noisy bird, now and then emitting a harsh cackling sound. While shy and secretive of habit, the clapper is easily flushed from the marsh during high tide, and thousands of them are taken by hunters in Virginia's two Eastern Shore counties, Northampton and Accomack.

The clapper feeds on vegetable grasses, seeds of wild oats and rice, and the smaller saltwater crustaceans. The

nest is a platform of dead weeds in the marsh, usually from 6 to 10 inches off the ground, supported by stems of marsh grass. Eggs number 6 to 15, are white to buff, and are blotched and dotted with chestnut and lavender.

Its small relative, the sora, has a short stout bill and feathered forehead to the base of the bill. It is about 9 inches long, olive-brown above and gray below, with face, chin and throat black. Unlike other rails found in Virginia, it does not nest here, but flies down from the north in September and October, stays awhile, then moves on with the advent of cold weather.

Sora emit a sharp *keek* which is familiar to the sportsman who hunts them in freshwater marshes at high tide. They feed largely on wild oats and rice, mixed with other freshwater vegetable matter. The sora is a delicious table bird, and, while small, is much sought after by gunners.

Similar but less common in Virginia is the Virginia rail. About 10 inches long, it is red-brown and has a long bill. Rarely seen here are the smaller yellow rail and black rail.

The coot, a slate-gray, ducklike waterbird with a chicken-like white bill, is about the size of the average wild duck. Coots are not to be confused with scoters which are often called "coots" but which are true ducks. The coot does not have webbed feet like a duck, but has lobes or flaps on each toe.

Coots love open water and frequently can be seen in "rafts," bunched up with ducks on Virginia tidal rivers, estuaries, and at Back Bay. When they rise, they skitter and spatter over the water and have a hard time getting into the air. They are good swimmers and dive easily.

While a great many are killed by waterfowl hunters each year, they are not as prized a game bird as the duck. Coots feed mostly on vegetable matter, eating roots, bulbs, and tender grasses. They will eat insects, snails, and other animal life when available.

The Florida (or common) gallinule and the purple gallinule (rare) are smaller than the coot, and are usually seen in freshwater marshes.

### **Woodcock (*Philohela minor*) Wilson's Snipe (*Capella gallinago*)**

These are the only true shorebirds which, during recent seasons, have been legal game in America.

The woodcock—our only shorebird with very rounded wings—is 11 inches long, chunky, has a long bill, short neck, big eyes, and upperparts mottled like dead leaves. A solitary, secretive, largely nocturnal dweller of the swamps, wet woods, and thickets where it probes deep into the mud for earthworms and grubs, it is seldom seen until it suddenly zigzags off from underfoot with a twittering whistle.

Four buffy eggs are laid in a sparsely lined depression in the ground often near a moist thicket.

The snipe, called jacksnipe by sportsmen, is our only chunky shorebird with a long bill and striped head. About 11 inches long, it has long pointed wings, a brown back, spotted breast, white belly, and orange tail.

It is also solitary and secretive, inhabiting meadows and marshes, fresh or salt, where it eats earthworms, insects, crustaceans, snails, and plant seeds. It lays 4 pale brown eggs blotched with dark brown in a shallow depression lined with grass in or near a boggy marsh.

## Wildlife on a DIET

By J. P. LINDUSKA

*Director of Wildlife Management, Remington Farms  
Chestertown, Maryland*

THE past generation of parents all have youngsters they can look up to . . . literally. If dad is 5 feet 11 inches, his 16-year-old namesake is likely to be a gangling six-footer. And the daughters invariably have a few inches on mom . . . vertically, that is. There is a reason for all this.

The last decade has produced facts galore on the nutritional needs of humans. We've learned plenty, too, about the vitamin and mineral needs of domestic animals. The results are evident in many directions.

Several million recruits in World War II averaged measurably taller than the doughboys of an earlier generation. It was mainly a matter of proper nutrition from the cradle on up. And look at what has happened in the livestock and poultry business. Today, supplementary feeding of cattle adds factors essential for well-being and rapid growth. The result: more and better beefsteaks months ahead of what we used to expect.

Chickens, also, are rushed along to edible size weeks ahead of former schedules, thanks to a scientific compounding of feeding rations.

But what about wildlife? Do we find rabbits with rickets? Or quail with curled-toe? As you would expect, detecting these and other signs of vitamin deficiency in wild animals is a difficult chore.

Nature, in her ruthless way, is quick to eliminate the sick and ailing. Nevertheless, facts are accumulating which show conclusively that wild species reflect in many ways the adequacy of their diet.

Take deer, for instance. It's seldom that you'll find one with an empty stomach. Even starving animals will have full bellies, if it's only pine needles. But bulk is no measurement of nutritional value and browse can vary from grade A fodder to useless stuffing.

Eventually the difference shows up in various ways. Of first interest to hunters is the matter of numbers. Good range, nutritionally adequate, will support a high deer population. Beat-up, overbrowsed woodlands, or range composed of plants having low forage value have lesser numbers.

Good range permits a high reproductive rate for deer. Twins, even triplets, are common on areas offering a complete diet. Poor range means barren does and fewer fawns. Production may be a full 50 percent below the potential. Survival is reduced, too, so the net effect is a cutback in numbers.

Body weight and antler size give further clue to the bill-of-fare of deer. Big animals with big racks simply are not the product of areas lacking in proper feed.

You would hardly expect that soil testing would be a part of the game manager's function. But it may be.

It's becoming more and more evident that soils which are fertile for plants are fertile for wildlife. And other things being equal, the best soils will produce the biggest and best game crops. In Missouri, the "show me" state, some of the boys had an inkling of this "down to earth" relationship. They decided to show others.

Missouri was in the business of exporting cottontails in years past. Hundreds of thousands were being live-trapped and the biologists saw an opportunity for putting two and two together. They weighed over 175,000 live-trapped bunnies, and they made separate note of the soil type from which they came. Result? Those trapped on the best soil areas weighed a third more than those taken on poor soils.

They dug deeper. From the major soil types in the state they collected 450 cottontails and took them into the laboratory. Those taken from rich soil areas had femur bones twice as strong and 12 percent larger than those from soils of low fertility.

The same with raccoons. Those from areas of rich soil weighed 22 percent more than their brethren on poor land. And per unit of area trapped, five times as many were taken on land of high fertility.



Photo by Don Woolridge from National Audubon Society

Body weight and antler size are clues to the bill-of-fare of deer. Big animals with big racks are not the product of areas lacking in feed.



Game birds, too, have requirements for minerals and vitamins that must be met if their kind is to prosper. Quail, for example, are susceptible to winter killing in the absence of vitamin A. Phosphorus and calcium are essential to proper reproduction by these same birds.

Insufficient amounts of these minerals reduce egg laying, hatching and survival of young . . . even into a subsequent generation. There is, in fact, fair evidence to show that the distribution of the popular ring-necked pheasant is determined more by calcium in the soil than any other factor.

Occasionally nutritional problems of wildlife appear unexpectedly. The chronic die-off of geese on a North Carolina wintering grounds proved to be such a case. For years, a greater than normal mortality occurred each winter along the same section of coastal shore.

Investigations revealed the immediate cause of death to be due to heavy infestation by gizzard worms and a variety of other internal parasites. But why were adjoining goose flocks, north and south, not infested, or, at least, not succumbing to these same parasites? It took a couple of season's work to solve the mystery.

The ailing flock, it was found, was subsisting mainly on a single species of natural food. The specialized diet was not adequate nutritionally and the birds declined in vigor. It was only after the geese became weakened that the parasites could thrive in a degree ultimately to kill them.

Game management in the future will take advantage of facts now accumulating on the inner workings of wildlife. And gratifying returns should follow on the scientific method. So far, the surface has just been scratched. And

while we may well question the old adage that sprinkling salt on a bird's tail will make it tame, there's good reason to believe that sprinkling a little calcium on its tongue may help it to live.

## WHERE WE STAND TODAY IN CONSERVATION

(Continued from page 5)

latest information on improved methods and programs, the conservation programs in Canada, the United States, and Mexico have been greatly advanced beyond what they were when we met in Washington in 1936.

In the United States the wildlife and recreational programs are finally getting the attention they deserve on the national forests and other public lands; the water pollution control and abatement programs have become a MUST on the part of an aroused public; the waterfowl restoration program is being stepped up nationally and within the states; the two federal-aid programs are a great boon to the states; the soil conservation job being performed in many states has done miracles; small watershed programs are putting flood control where it belongs; fisheries research and management programs are being advanced; a national recreational resources survey is underway; and finally we are taking a serious look at the pesticide and poison spray situation.

We still have many problems to lick, notwithstanding the progress we have made. Among them are such items as stopping the drainage of the prairie potholes under the guise of aiding agriculture; better control of devastating forest fires and protection of watersheds; how to handle the synthetic compounds and detergents in our sewage treatment plants; recognition of the use of water for fish, wildlife and recreation as a beneficial public use in all states; and many others.

One of the things I like best about the conference is the additional recognition of the broad field of "natural resources" which the conference title now bears.

Another is the fact that the conference program is largely dominated by the young, well trained workers. They are no longer the minority we knew back in 1936. And instead of seven related meetings as we had in 1936, we now have dozens of them.

Probably one of the highest tributes of all came to me recently from Karl T. Frederick, one of the participants at the very first in 1915, who said:

*"I think one of the most important lessons that was learned from the conferences (and I am sure he meant both those sponsored by the American Game Association and the Wildlife Management Institute) was the need of honest cooperation among different groups insofar as their consciences would permit."*

Ladies and gentlemen, with the "cross-fertilization of ideas" that regularly takes place at these big international gatherings, I am confident that we will continue to have "honest cooperation," and that future conferences will be equally effective and productive.



Photo by Maslowski & Goodpaster

Cottontails on the best soil ores weigh a third more than those taken on poor soils. They also produce more healthy offspring.

# *The Cooper's Hawk*

By DR. J. J. MURRAY  
*Lexington, Virginia*

IT IS one of our human traits to think that the universe belongs entirely to us. From that standpoint we are quick to classify animals as "bad" and "good." The truth is that there are no "bad" or "good" animals. Animals are simply natural. They do the things for which they were created. When we say "good" or "bad" we simply mean that they are useful or harmful to man's interests, and we are not always careful in measuring what are our real interests.

The Cooper's hawk is a case in point. Of all Virginia hawks it most deserves from our viewpoint the term "bad." It preys largely upon other birds. It sometimes takes quail. It, and not the large slow-flying hawks, such as the red-tailed hawk, is the true "chicken hawk." Ironically enough, however, it is the one hawk that is rarely killed by the farmer or sportsman who shoots at every hawk he sees. The Cooper's hawk is too fast and too rarely flies out in the open to make a good target, all of which gives point to the conservationist's claim that there is little sense or profit in the warfare against hawks.

There is a place in nature for the predator; otherwise, it would never have evolved to do its work. The Cooper's hawk, in preying upon the weak and sickly bobwhite individuals, does a distinct service in keeping up the quality of bobwhite stock and thus in improving the hunter's sport. This is not to say that the Cooper's hawk does not also kill a certain number of healthy bobwhites as well as many songbirds.

The Cooper's hawk is one of the "blue darters," the other being its smaller copy, the sharp-shinned hawk. The word "darter" comes from its speedy flight through tangles of trees and bushes, while "blue" comes from the slaty color of its back. Below, it is light in color and, in the adult birds, heavily barred with reddish. In young birds the markings on the breast are dark. Rather below medium size for a hawk, it is 15 to 20 inches in length, with a wing spread of 27 to 35 inches. As is generally the case with hawks and owls although not with other kinds of birds, the female is noticeably larger than the male.



These birds build a compact nest with a frame of sticks, nicely lined and placed well up in an oak in thick woods. When an intruder comes into the vicinity of the nest where there are eggs or young, the adult birds fly about with harsh "cac-cac-cac" calls. The eggs are larger than bantam eggs, dull bluish white and lightly marked with brown spots, three to six to the clutch. The young birds when hatched are covered with soft whitish down. Fed on small birds, with an occasional mouse for dessert, they grow rapidly. When they leave the nest they are apt to weigh more than their parents, but as they begin to hunt for themselves the excess fat is soon lost and the muscles become like steel bands. All in all, the Cooper's hawk fills its place in the scheme of nature in a striking and efficient way.



# VIRGINIA WILDLIFE

# CONSERVATIONGRAM

Commission Activities and Late Wildlife News . . . At A Glance

## GOVERNOR SIGNS BOATING SAFETY, HUNTING AND FISHING LICENSE FEE INCREASE ACTS.

Three important acts of the 1960 General Assembly affecting Virginia sportsmen were signed by Governor Almond on March 31. One, intended to promote boating safety, involves the registration of all boats propelled by motors of 10 horsepower or more. The others, aimed at getting the state's Commission of Game and Inland Fisheries out of the red, increase certain hunting and fishing license fees.

The boating safety act, which goes into effect on July 1, names the state game commission as the agency responsible for administering and enforcing its provisions. These include the identification by registration and number of all boats propelled by machinery of 10 h. p. or more and the provision of regulations pertaining to safety equipment, safe handling of all vessels using public waters, and the reporting of boating accidents. Game commission officials have requested boat owners to wait until further notice before applying for a certificate of number. A system of handling registrations is in the process of being set up and approved by the U. S. Coast Guard, which has waived until July 1 the numbering requirements for all undocumented vessels.

State laws were also amended to provide that, after July 1, the license fee to hunt and fish in the county or city of residence shall be two dollars (a one-dollar increase), the state resident season license to fish shall cost \$3.50 (a fifty-cent increase), and all state residents including those who hunt only in their county of residence shall pay one dollar for the bear, deer, and turkey license. The price of the nonresident bear, deer, and turkey license was raised from \$2.50 to \$5, and a provision was inserted in the law stating that no fishing license shall be required of resident persons 70 years of age or older.

Other bills of interest to sportsmen recently signed by the governor include: House Bill Number 267, which provides for a trip fishing license in Shenandoah National Park. To be available for three dollars to residents and nonresidents beginning July 1, the license will be valid for three successive days for trout only inside the park boundaries. State resident and nonresident fishing licenses, used in combination with resident or nonresident trout licenses, will continue to be valid in the park.

House Bill Number 392, which provides a fine of not less than \$500 nor more than \$1,000 and a prison term not to exceed 12 months, either or both, for any person convicted of trapping, attempting to take by means of a trap, offering for sale, selling, offering to purchase or purchasing any migratory game bird, or convicted of possessing any such migratory game bird taken by means of a trap.

## GAME COMMISSION PURCHASE OF 16,000-ACRE ROCKBRIDGE COUNTY TRACT APPROVED.

The Virginia Commission of Game and Inland Fisheries was granted governor's approval March 25 to proceed with the purchase of 15,954 acres of mountain woodland in north-western Rockbridge County between Goshen Pass and U. S. Route 60. The new public hunting and fishing area will cost the commission \$275,000 plus approximately \$10,000 for boundary surveys and \$5,000 for title abstracting and insurance. Three-fourths of these costs will be paid for with federal aid funds derived from an excise tax on arms and ammunition. The balance will come from state receipts from the sale of hunting licenses. To be known as the Gays Run Wildlife Management Area, it will become the eighth in a statewide system of game commission-owned areas being purchased to assure future generations of a place to hunt and fish.





Rockfish are often caught on the James River at the mouth of Chip Oak Creek. An old wrecked ship provides excellent footing for the spin caster. Rockfish are caught in fresh-water Buggs Island Lake as well.



April is the month for running of herring and shad. Scenes like these are common as Virginians line Tidewater creek banks with nets and poles in pursuit of these invaders from saltwater.



Small private ponds dot the landscape in Tidewater Virginia. Bass, bream, and pickerel are most often taken in small ponds. Ross Walker's pond in Hanover County provides excellent pond fishing.



The picturesque Blockwater River in Isle of Wight and Southampton Counties (above), with its dark water and crowded cypress trees, teems with bass, pickerel, gar, and red-breasted sunfish.

Tidewater Virginia is composed of several different water habitats. Across the top of this page are pictured examples of river fishing. Across the bottom of the page are scenes of lake and pond fishing. To the left we find creek fishing for herring and shad, and to the right are shown the two types of fishing found in Bock Bay.

## Fishing In Tidewater

As the soft, damp fog rolls up its blanket of white mist and the yellow rays of a warm morning sun begin to clear the air, another day of fishing begins in Tidewater Virginia. Minnow buckets are dropped overboard. Spinners and plugs are cast aloft. Bass and pickerel, crappie and perch, stir in deep, dark waters. Dip nets scoop into the moving masses of herring on nearby creeks. Other nets hang heavy with roe-swollen hickory and American shad. Boats are launched in lakes and ponds. Dams and bridges become crowded. Docks and wharfs sag with the

Text and Photos C

Airfield Pond in Sussex County, one of 14 game commission-owned ponds in the state.





One of the most famous fishing areas in southeastern Virginia is the mouth of Gordons Creek on the Chickahominy River. Lined with cypress trees, this creek (shown below) has produced many a fine largemouth bass.



## Tidewater Virginia

weight of tackle and boots and men. The tide comes in and the salt water mixes with the fresh on its journey to the sea. The tide goes out and with it the drainage from a thousand lakes and ponds and streams. The Chesapeake Bay is the mighty hand whose many fingers provide Virginia with sport fishing as exciting and rewarding as anywhere in eastern United States. The Potomac, the Rappahannock, the York, the James, the Chickahominy, and many others all feed the biggest saltwater fishing trough in America, Chesapeake Bay. This is Tidewater Virginia.

George H. Harrison

Old Dominion, affords largemouth bass, pickerel, bream and crappie fishing.



Walker's Dam at Lake Chickahominy is lined with hopeful fishermen throughout the spring and summer. Here a shad is netted in early spring. Largemouth bass are plentiful in these waters, along with crappie, bream and pickerel.



Fishermen who come to Back Bay may fish for crappie and bluegill in the ditches or creeks (above) or try for larger prizes like largemouth bass around the duck blinds in the bay (below).



Lake Cahaan, the water supply for the city of Portsmouth, has given many anglers that thrill of their life when they hooked a largemouth bass weighing around nine pounds. Also found here are pickerel, bream, crappie, and white perch.







Commission Photo by Kesteloo

Few acres managed in any other way can yield so much dollar value as artificial fishing lakes near centers of population congestion. Richmond's Byrd Park Lake (above) is popular all summer long.

## The Economic Value of Sport Fishing

By RICHARD H. STROUD  
*Executive Vice President, Sport Fishing Institute  
 Bond Building, Washington, D. C.*

THE word "conservation" has had several meanings over the past several score years. It is a changing word like many others in our language. This is natural because the world is a changing place and we must change with it or perish. The observation has been made repeatedly that nothing stands still; we either progress or retrogress.

So it is with the word "conservation." At the beginning of this century conservation meant "preservation." If you wanted to conserve a resource you had to lock it up and keep it from being used. Successive wartime emergencies have placed great drains upon the stocks of non-renewable mineral resources such as oil. Conservation of these mineral reserves became important. In this application, to conserve meant to use the known supply in a controlled manner, reducing wastage, improving extraction methods, and finding new supplies.

In the case of renewable natural resources—soil, water, forests, grasslands, fish, wildlife—to conserve has now come to mean to use wisely. This implies the development and application of management practices (based on continuing research) designed to produce and maintain an abundance of these resources sufficient to permit heavy use yet provide for their continuance in abundance year after year. With respect to sport fish it means that fishery biologists must learn all they can about fish populations and devise and apply fish management practices that will assure satisfying catches of fish year after year to increasing numbers of anglers.

This is a tremendous task. Unfortunately, from the standpoint of sport fishing, many of the factors that control land and water use are beyond the direct control of the biologists. They cannot, for example, veto a proposal to construct a highway that may affect an outstanding bass or trout stream. Similarly, they cannot veto the con-

struction of a large reservoir that may be needed for a drinking water supply or for hydroelectric purposes even though it may profoundly alter the character of a well established sport fishery.

But if they are suitably armed with facts about the economic value of retail business generated by the fishermen in pursuit of their sport, and can provide reasonable estimates of fishing use under the present and future conditions, they can often cause favorable modifications of plans that would otherwise produce great damage to fishing. Spawning areas may be provided, needed minimum flows may be guaranteed, or any one of a number of modifications undertaken that will assure provision of abundant good fishing even though it may be of a different character.

For example, a warm-water stream will be profoundly affected by construction of a high dam. One kind of construction design may result in superior reservoir fishing for bass, crappies, walleyes, etc., above the dam and a new and spectacular coldwater fishery for trout below the dam. Another kind of construction design would result in poor fishing in the reservoir above the dam and continued traditional fishing downstream, though reduced to the extent of its flooding by the reservoir.

Some folks are much disturbed by attempts to develop dollar values for sport fishing, believing that the true importance of fishing is intangible and therefore not measurable. However, the fact that fishing is the contemplative sport does not mean that a minimum evaluation of the goods and services used when fishing cannot be made and compared to other values computed in similar fashion. All who fish for sport will probably agree that such figures are *minimum* values at best. Nevertheless, the single common denominator in use for measuring the place of various competing interests in a multipurpose project is the dollar. We must recognize it, like it or not. If we ignore this fact



and fail to develop minimal values, sport fishing interests will not be considered in project planning. It is as simple as that, and boils down to "do or die."

Indeed it has been only since 1955, when the first national economic survey of fishing and hunting was conducted under sponsorship of the U. S. Fish and Wildlife Service, that fishing and hunting have begun to win significant consideration in overall resource planning. In that study the remarkable discovery was made that there were one or more fishermen or hunters in one out of every three U. S. households. Further, one in every four men and one in every 11 women fished. It was borne out that fishing is a popular form of family recreation.

The 20.8 million people who fished in 1955 spent the impressive sum of \$1.9 billion for oil, gasoline, and other travel costs (food, drink, lodging), for equipment (boats, motors, fishing tackle and accessories, special clothing, camping and picnic gear, etc.), and for special fees and fishing licenses. This amount exceeded the total (\$1.7 billions) spent by Americans for admissions to all spectator amusements (motion picture theaters, legitimate theaters, opera, and all kinds of spectator sports). It was only a little less than the amount (\$2 billions) paid to utilities for such a necessity as household gas.

Individually, average annual expenditures came to \$91.98 per angler. If he fished in freshwater his expenditures averaged \$77.38. If he fished in saltwater they averaged \$107.29 (\$91.18 on the East and Gulf Coast; \$155.74 on the West Coast). Altogether, Americans devoted nearly 400 million man-days to pursuit of their favorite means of relaxation outdoors—with about 339 million of them on fresh waters.

The freshwater angler fished on the average between 18 and 19 days during the year. Thus he spent about \$4.20 per day for his fishing, including all costs of the goods and services he required "out fishing." Interestingly, a survey by the Sport Fishing Institute has indicated that the average daily catch by anglers in fresh waters throughout the nation amounts to about 2.2 pounds. This would indicate that each pound of fish caught by an angler costs him about \$1.80 provided his daily fishing costs are about average.

If an angler can do his fishing locally, he can avoid substantial travel costs. In fact, about 30 percent of all anglers were found to fish within a range of 100 miles of home. Availability of nearby fishing facilities, therefore, makes it possible to enjoy fishing more economically than average—by eliminating the extra costs of a long trip such as lodging, restaurant meals, and extra car costs. Elimination of these means that the average daily cost of a fishing trip can be reduced by about one half, or about \$2.10.

Such a figure provides a basis for informed judgement as to the wisdom of constructing artificial fishing lakes near centers of population congestion. This, together with other research findings, furnishes a guide to how many lakes or how much surface area of fishing water is needed or will be used. Underlying this, however, is the sure knowledge that the fishing to be provided must be good—or the facility will not be utilized. If it is good, a new

fishing lake (where facilities are scarce), or a renovated old fishing lake (where facilities are abundant) will yield big dividends both economically and recreationally. For the fishing to be good—the key to success—there must be intensive scientific management on based extensive research.

An outstanding example of this is the public fishing lake program of the Alabama Conservation Department. Sixteen lakes comprising 841 surface acres of water have been constructed and intensively managed for public fishing for periods of up to eight years or more. Time has shown that, with increasingly heavy use, the desirable size is 200 acres or more per lake. Records for 12 of these lakes older than two years (the first year gives a distorted picture of what fishing will be like so that records for the 4 newest lakes are not included) show that much sustained good fishing has been created in Alabama on an economically feasible basis.

Annually, for the 12 lakes, there were more than 162 fishing trips (man-days) per acre resulting in an average harvest per acre exceeding 174 pounds of fish. This harvest was made up of about 137 pounds of bluegills and redear sunfish, over 29 pounds of largemouth bass, 7 pounds of bullheads, and less than 1 pound of crappies per acre.

The lowest annual utilization recorded for any of these 12 lakes was 89 individual fishing trips per acre; the highest was 242 trips. The lowest harvest was about 129 pounds of fish per acre; the highest was 248 pounds. The proportion of bass to other species in the catch varied from about 7.5 per cent to about 38 per cent in individual lakes.

It seems reasonable to assume that a properly constructed, intensively managed lake of comparable size near large population centers in Virginia can also support 150 or more man-days of fishing per acre each year. It is similarly reasonable to assume that anglers will actually spend about \$2.10 daily to go fishing on it for the goods and services they need, directly or indirectly, whether they are fully aware of it or not.

Such a lake is scheduled for construction on South Run and Opossum Branch near the town of Burke in Fairfax County. It will be the 210-acre Burke Lake, first such facility to be built in Northern Virginia by the Commission of Game and Inland Fisheries. If it draws only from the estimated 40,000 anglers in Fairfax County, Arlington County, Falls Church, and Alexandria, fishing use may well quickly exceed 150 per acre, or more than 30,000 total annually. In all, then, at least \$63,000 per year will be spent locally by anglers using the lake for oil and gasoline, fishing tackle and other sporting goods, and parking fees, bait, etc., at filling stations, stores and concessions in the area.

The Burke Lake will have a useful life, with proper construction and intensive fishery management, spanning several generations—a permanent recreational asset. In the course of a single generation, however, this one lake will generate retail business amounting to more than \$1<sup>1</sup>/<sub>4</sub> million! Few acres managed in any other way can yield so much dollar value—or such incredibly valuable therapy for tense minds. For, after all, the chief value of fishing lies in the unique fact that it, above all others, is the "contemplative" sport.



## Don't Overlook The Gar

By FRANKLIN A. TYLER, D.D.S.  
*Richmond, Virginia*

**F**OUND in the New World are archaic fish forms which have practically disappeared everywhere else.

The bowfin and gars are relics of the Holocene fishes which were dominant in early geological time. In that period of fish history, armor was customary in all fish forms. The ganoid or armored fish of today—the gars, paddlefish, sturgeon, and the bowfin—are of the same type. Only the gars and the bowfin are predators; the others feed on very small plants and animals.

The “garpikes” and the alligator gar form the two main varieties of the fighter ganoids known in the U. S., Cuba, and Mexico. They are most common in the South and Midwest.

The “garpike” (the longnose gar is the only one found in Virginia) may reach a length of six feet, and, in the water, its diamond-shaped enamelled scales give it a pretty appearance, even if in reptile form. It has a long, flat, narrow, scissor-like beak armed with double rows of sharp teeth. In the tail third of its length, it is speckled with dark splotches; toward the head its coloration is greenish-yellow and gray.

The coloration of the alligator gar is more subdued, darker in color, and its tail is an awkward appendage to a heavier body. Its length may exceed 10 feet; a 20-foot alligator gar hangs in a Midwest museum. In the Mississippi basin, 100-pounders have been often reported. The alligator gar has a wider upper jaw which curves downward at the tip like a bird's beak, probably accounting for the positive snap when the jaws are suddenly closed.

Both are destructive to fish, and their fishing methods are most effective. A group of garfish, usually of similar size, floating near the surface of a pond or stream in a leaflike pattern, look as lifeless as floating sticks, but an unwary fish swimming into this group is a goner. If a gar lunges and only cripples, the victim struggles to the surface and is quickly attacked by the nearest gar. The double row of sharp teeth makes it difficult for anything to wiggle free, although fish do escape on occasion. Quite effective, too, is their method of charging into a closely packed school of fish, snapping as many as can be reached and eating the injured at leisure. This probably accounts for the concentration of gar in the larger bodies of water where numerous schools of fish may be followed.

Gar spawn in May in shallow water, and, when this occurs, each female is surrounded by three or four males. The eggs are in a sticky mass which cling to rocks and require only a short incubation period. Following incubation, the young emerge as larvae and again fix themselves to stones by means of an adhesive disk attached to the end of the snout. This organ disappears when the yolk sac upon which the miniature gar lives is absorbed, and then the new “fish-reptile” swims away. It feeds briefly on mosquito larvae and other small aquatic organisms for a few weeks before turning to a steady diet of fish. My observations indicate that the greatest concentrations of young gar are in brackish water. I have observed countless numbers filling creeks of the Northern Neck and the Eastern Shore. On seining for grass shrimp, miniature gar are taken, but, unfortunately, they are poor bait as they quickly die when fastened to a hook. Incidentally, they have an attractive greenish coloration which blends with the water, making it difficult to observe them when they are very small.

Gar have been the subject of many superstitions. Of interest but questioned is the report of John James Audubon, the famous naturalist, describing Adamantine Garfish: “This fish is reckoned the wonder of the Ohio. Found as far as the Falls and probably in the Mississippi. One was caught weighing 400 pounds, but its length is usually four to 10 feet. Taken only by seine or very strong hook. Scales are hard as flint and proof against the prongs of a gig and even lead balls. Very voracious fish; good to eat. Called garpike, devildish, diamondfish, etc. Large stone-like scales strike fire with steel and are bulletproof.”

In the far South, gar fillets are soaked in vinegar, parboiled, and cooked with wild onions; but few eat them even then. Dogs will not touch them. Many are sold as food in the cities of the far South under another name, and the scales are used commercially.

Gar have another distinction: they are the only freshwater fish whose roe is actually poisonous.

Many blame the decline of bass fishing in some streams and ponds on the year 'round cruising of the gar, but in view of the many known predators today it is impossible to assess the actual damage done by these freshwater tigers. Actually, in many areas of the United States including



Lake Drummond in Virginia, fishery biologists have found that predation by gar on overabundant forage fishes is entirely beneficial. Wholesale condemnation of any of nature's own is seldom wise.

Many persons do take a dim view of locating a home or camp on gar-infested streams, and we do know that the gar takes a toll of commercial fish nets and traps that can be measured in dollars and cents, so he is damned accordingly.

A word about one type of gar fishing. We know they are great fighters, landed infrequently, and, where the larger ones consistently congregate, furnish exciting sport. In one such spot on the Mattaponi River, we had a real introduction to gar fishing with the late W. C. Butcher of King and Queen as a most able instructor; this after admitting to my inability to land a single large gar. Over a sandbar covered with a few feet of water at mean tide and adjoining a very deep hole in the river we hooked gar as long as canoe paddles, landing quite a number. We were seemingly limited only by the size of the landing net as to the whoppers we took. Those lost at the boat would appear to recover and then twist away from hook and net. Our hooks were short, strong, filed sharp, and attached to wire leaders; the minnows were of average or large size, fished 12 to 18 inches deep and a long way from the boat. The ideal spot for a strike was just where the bar ended and deep water began, and we had many fish on in the course of an hour. When a strike occurred it began as a nibble and a short run followed. Then came a slightly longer run ending in a series of jerks, but my instructor cautioned me to wait for the "long run," and when I did strike, the fish was on. They fought savagely and intelligently, pretending to tire until the net was seen and then go out again, furnishing very good sport indeed. One caution: trail a caught gar in the water instead of bringing it aboard, it being pretty in its habitat but most repulsive close at hand. Its slime has a distinctive odor, it bleeds like a rabbit and all over the boat, and this too seems to have an odor all its own.

Archery groups would do well to consider taking advantage of Virginia's law permitting the taking of gar with bow and arrow. A capable man with a bow and arrow would be a wonderful help in subduing an oversized gar when brought to the boat, as this seems to be the critical period of the struggle; all too often the fish is too large for the net and twists off the hook to safety. Many are seen in shallow water when the water is low and the weather warm, but they spook easily. They appear to follow a daily pattern in this period, so decoys, chum, anything that would bring them close might give archers as good targets as carp, anyway. One would have the satisfaction, too, of helping in "aquatic predator control."

So, don't overlook the gar.

the whole gamut of areas that come under the category of wet places. This will take training and education and time.

Meanwhile, the immediate problem at hand in saving wetlands is to prevent marshes, swamps, and similar areas from being drained, filled, flooded, or otherwise destroyed. This can be done, in part, by developing local, state, and national interest in wetlands and by proper and coordinated advance planning wherein wetlands are given their rightful place in future land use.—J. J. S.

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### Paul O. Peters

It is with profound regret that we announce (quite belatedly, as the news was late in reaching us) the passing of the dean of Izaak Waltonians in Virginia—Paul O. "Pop" Peters of Arlington—on December 30, 1959.

"Pop," as everyone called Mr. Peters, was truly a Waltonian through and through and his departure from the conservation scene, but not from our memories, will be felt by all who knew him and loved him.

Pop spearheaded many Waltonian battles—both at the national and state levels—and was a member of the national board of directors for more than ten years, president of the Arlington-Fairfax chapter for two years in the late forties, and president of the Virginia State Division in 1953-54. At the time of his death he held membership in the Arlington, Alexandria, and Fredericksburg chapters.

Mr. Peters played a prominent role in many conservation issues: opposing high level dams on the Potomac River above Washington, and encouraging voters' approval of expanded sewage disposal plant facilities in Arlington, the reduction of pollution in the Shenandoah River, and the saving of large oyster beds in the lower Potomac and Chesapeake Bay area. He was one of the first to speak out against uncontrolled use of pesticides and also focused attention on the problem of household detergents in public sewage.

Mr. Peters was one of the founders of the Outdoor Writers Association about 20 years ago.

He not only traveled widely in Virginia helping to organize new League chapters, but also visited many parts of this country on behalf of the Izaak Walton League of America. He was a forceful supporter of more conservation education in Virginia's public schools and colleges and was one of the League leaders in the initiation of the cooperative wildlife essay contest sponsored jointly by the Commission and the Virginia Division, Izaak Walton League of America.

An expert on government financial statistics, Mr. Peters served as a research consultant to members of Congress and also was editor of a news service.

He recently gave his library of nearly 80,000 books and publications, believed to be the most extensive outside the Library of Congress in its field, to Worcester (Ohio) College.

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## EDITORIAL: OUR VANISHING WETLANDS

(Continued from page 3)

their troubled souls. What is necessary in the Old Dominion and throughout the nation is a new attitude toward

# Incubation of Birds' Eggs

By ROBERTS MANN and WILLIAM J. BEECHER

**A**LL birds lay eggs. Most reptiles lay eggs. There is one peculiar group of birds, the "mound builders" found in Australia and neighboring islands which, like many reptiles, lay their eggs in heaps of soil or decaying vegetation and pay no more attention to them. The young, after hatching, are able to fly almost at once.

All other birds incubate their eggs by supplying heat from their bodies, and give the young devoted care. That heat may be considerable, since the normal temperature of a bird varies from 100 to 112 Fahrenheit according to the species. Ordinarily, incubation does not start until the clutch or "set" is completed. As that time approaches the bird becomes more secretive and stealthy. A bare spot or "brood patch" is developed on the breast by moulting. This, specially equipped with blood vessels, becomes suffused with blood. Then the bird becomes "broody." Ducks and geese create this bare spot by pulling down from their breasts so that the eggs can be in direct contact with the skin, and cover the nest with this down whenever they leave it to feed.

Songbirds nearly always lay one egg per day, usually in the morning, but some of the larger birds—hawks, owls and geese, for instance—are more irregular. Once incubation begins the bird seldom leaves the nest, and then not long, because the eggs will not hatch if they get too cold. When both parents are colored alike they usually share equally in sitting on the nest; but when the male has

much brighter colors he usually stands guard over it while she feeds or else he brings food to her. In the phalaropes, a group similar to the sandpipers, the female is more brightly colored than the male and he not only incubates the eggs but also takes care of the young. Among such big flightless birds as ostriches, cassowaries and emeus, it is said that the male tends to all or most of the domestic chores.

The length of the incubation period varies from 10 days, with the cowbird, to 80 days with the royal albatross and from 70 to 80 days with emeu. Sparrows require from 11 to 13 days; thrushes, including the robin, 13 or 14; domestic chickens 21; ducks, depending on the size, from 21 to 30; geese from 30 to 35; and 50 to 60 days for ostriches. It seems to depend upon the size of the egg, the kind of young and, perhaps, on the body temperature of the parent.

Most ground-nesting birds have relatively large eggs and a long incubation period. Their young, when hatched, are wide awake and covered with down. Soon after drying off they are able to follow their parents around and feed themselves. These are the *precocial* species. Most birds that nest in trees or holes, including the songbirds, are *altricial* species; they have small eggs, a short incubation period, and the young are blind, naked or nearly so, and helpless when hatched.

During incubation the eggs have to be turned once or



**The American oyster-catcher is found on Virginia's wilder outer beaches, where it lays three buffy eggs, blotched with brown, in a simple depression.**

Photo by Allan D. Cruickshank from National Audubon Society





Commission Photo by Kesteloo

The mallard hen doesn't begin to incubate her eggs until all of them (8-12) are laid. The incubation period is usually 26 days.

twice a day so that they will be heated evenly and the membranes of the embryo will not adhere to the shell. Some birds, like a hen, do this with the bill; others with their feet. When hatching the egg is "pipped" from the inside and, to do this, the young bird has a hard sharp "egg tooth" on its soft upper bill. Later, this disappears.

It's interesting to watch a mother bird return to her nest, carefully straddle the eggs, arrange them, wriggle around until she gets them all next to her "brood patch," and then contentedly huddle down. There she will squat, motionless, until perhaps the next day.

### 1,170 Receive Awards In Virginia Fishing Tourney

Some 1,170 anglers, more than double the 500 winners for the 1958 contest, received colorful citations, mounted on plaques and preserved under a coating of clear plastic, for outstanding catches in the Second Annual Virginia Salt Water Fishing Tournament, Tournament Director Claude Rogers has announced.

Seven of the 15 leading entries were heavier than the first place catch last year. These catches include an 81-pound black drum caught by James Topping of Hampton, Va.; an 86-pound cobia boated by Parker Forrest of Cape Charles, Va.; a 38-pound striped bass landed by H. S. Jones of Cape Charles, Va.; a 14-pound, 8-ounce bluefish taken by C. M. Campbell of Rockville, Md.; a 5-pound, 9-ounce sea bass by Clifford C. Hayter of Norfolk, Va.; a 5-pound, 15-ounce gray trout by W. R. Grindals of Onley, Va.; and a 4-pound, 10-ounce croaker by Kemper Goffigon, III, Cape Charles, Va.

Last year the flounder division led with a total of 103 citation-size fish. This year flounder entries were again the leaders, but there was a tremendous increase—521 flounders of more than five pounds were entered.

In addition to flounder most of the inshore species

showed an increase. Croaker entries above the two pound minimum increased from 32 in 1958 to 170 in 1959. Channel bass weighing more than 40 pounds increased from 53 to 101 with five of this species going more than 55 pounds. Sea bass above four pounds jumped from 36 to 77. Cobia over 45-pounds showed a big increase with 69 registered in the '59 tourney as compared with 13 in the 1958 contest. Striped bass weighing 12 pounds or better increased from 14 to 42 and spotted sea trout meeting the four pound minimum jumped from 5 to 22.

A 110-pound, 12-ounce yellowfin tuna set a new Virginia state record for Dr. J. E. Gladstone of Exmore, who landed his prize on July 5 while fishing off Wachapreague aboard the Silver Spray with Captain Earl Parker.

Another Virginia record rating special mention is a 58-pound wahoo boated on October 10 by W. R. Laughon of Norfolk while trolling off the Virginia Capes with Captain Bill Hall.

A 12-pound porgy taken off Cape Charles September 15 by William Luettinger and weighed in at Kings Creek Marina is believed to be the largest ever recorded by any angler fishing in Virginia waters.

Seven tarpon weighing from 47 to 87 pounds were boated by anglers fishing in Gull Marsh Channel of Virginia's Eastern Shore.

### Buggs Island Lake Proposed as Location for New Federal Refuge

A 36,200-acre John Kerr Reservoir National Wildlife Refuge at the reservoir of that name (known as Buggs Island Lake in Virginia) was recommended to the Army Engineers last October 20 by the Bureau of Sport Fisheries and Wildlife, according to Assistant Secretary of the Interior Ross Leffler.

He said the Secretary of the Army has authority to make the lands available from the 95,500 acres which comprise the project area for flood control and power development.

As now proposed, the refuge would include 19,000 acres of land and 17,200 acres of water. This is based on conclusions reached by the bureau in cooperation with the Virginia Commission of Game and Inland Fisheries, the North Carolina Wildlife Resources Commission and the Kerr Reservoir Development Commission concerning the possibilities of zoning the lands for wildlife purposes.

The report indicated the bureau probably would need additional land for raising of feed for the waterfowl which would use the refuge as a wintering and feeding sanctuary.

Leffler said any purchase of additional land would be several years in the future, and areas to be bought would be determined upon their capacities to provide for refuge needs and the willingness of owners to sell. Purchase funds would have to be approved by the Migratory Bird Conservation Commission, but establishment of the refuge would not require commission consideration.

Director D. H. Janzen of the bureau said that, in the event the refuge is established, boat launching, parking, picnicking and camping would be permissible.

Conflict with the present major recreational activities would be minor, he said.

# Questions and Answers Regarding The Virginia Boating Act of 1960

## What is The Boating Safety Act?

The Virginia boating safety act, passed by the 1960 General Assembly, was designed to bring about the safe operation of motorboats on the state's public waters. Virginia's law conforms with those requirements of the federal Bonner Act of 1958 (Public Law 85-911) and places responsibility for carrying out its provisions with an existing state agency. (Had a state act not been passed, the U. S. Coast Guard would have become responsible on April 1, 1960.)

## What is The Purpose of The Boating Act?

The primary purpose of the boating act is to promote boating safety. This will be accomplished through the enforcement of regulations pertaining to safety equipment and safe handling of all vessels using public waters, boating accidents and the reporting thereof, and the identification by number of all motorboats propelled by machinery of 10 or more horsepower.

## What State Agency Will Handle The Boating Act?

The Virginia Commission of Game and Inland Fisheries has been given the responsibility for the administration and enforcement of the boating act. However, the U. S. Coast Guard will not only continue to operate as it has in the past on navigable waters but will retain concurrent rights and responsibilities in all boating matters.

## As A Boat Owner What Should I Do Now?

If you own an inboard or outboard motorboat which is powered by a motor of 10 or more horsepower, do the following:

1. WAIT until public notice is given before filing an application for a number.
2. READ boating act and Commission regulation information as it becomes available.

## When Can I Register My Boat?

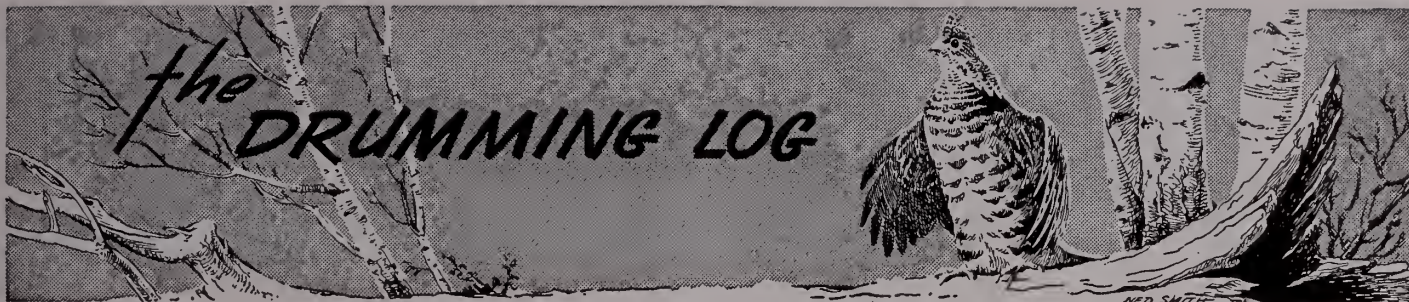
Officials of the game commission are anxious to implement the provisions of this act, but must have time to prepare the information, regulations, and the system for handling the registrations. The commission hopes to begin issuing certificates of number before June 1, 1960.

## What are the Main Provisions of the Boating Act?

1. Every motorboat (10 h.p. or more) on the public waters of the state must be numbered.
2. The number must be displayed on each side of the bow (regulations will describe where and what size).
3. Applications for the certificate of number must be made on forms supplied by the Commission. Those will be available locally about June 1.
4. The registration fee for the three-year period beginning July 1, 1960 shall be five dollars.

5. The certificate of number (pocket size) must be aboard the vessel whenever it is in operation.
6. A motorboat properly registered in Virginia may visit the waters of another state for up to 90 days without having to pay that other state's fee.
7. Transfer of ownership will necessitate an application by the new owner and a fee of one dollar. The number will remain the same; the number stays with the boat.
8. Lost certificates can be replaced upon application and the payment of a 50-cent fee.
9. The owner must notify the Commission within 15 days after an address change or the transfer of his interest in the boat.
10. Boat dealers and manufacturers may purchase certificates of number in order to demonstrate their products on the water. Fees for a single certificate of number are \$15.00 for dealers and \$25.00 for manufacturers. Additional certificates of number may be purchased for \$8.00.
11. The safety equipment prescribed for motorboats will conform to U. S. Coast Guard regulations (to be published later in detail).
12. The following boats will *not* have to be registered for use in the public waters of the state:
  - (a) Boats which are required to be numbered pursuant to a federal law by an approved system of another state.
  - (b) Foreign vessels.
  - (c) Boats owned by the U. S., a state or subdivision thereof.
  - (d) A ship's lifeboat.
13. Boat livery must register any and all boats which are to be rented for use with motors of 10 h.p. or more. It is the duty of these owners to properly equip these boats as required.
14. Safety regulations will make it illegal to:
  - (a) Operate boats or to manipulate skis, surfboard, or similar devices in a reckless or negligent manner, or while intoxicated.
  - (b) Water ski or surfboard from one hour after sunset to one hour before sunrise.
15. It will be mandatory to stop and assist after a water accident and file a complete report within 10 days after any such which results in death or injury to a person, or property damage in excess of \$100.00.
16. Violations of the Boating Safety Act are limited to a fine of not more than \$50.00, except in cases involving negligence or reckless operation.
17. The U. S. Coast Guard has waived until July 1, 1960 all numbering provisions for undocumented vessels principally used in Virginia waters.





### Winter Survey Shows Duck Population Down Twenty Percent

The total continental duck population in January 1960 was 20 percent below the level of January 1959, the Department of the Interior reports.

A slight increase in geese number, a 31 percent increase in brant, and a stable coot population were noted, but there was an overall decrease of 17 percent in the numbers of migratory waterfowl in North America in January 1960 compared with the previous year, according to the annual winter survey made by the Bureau of Sport Fisheries and Wildlife.

The redhead, the winter survey shows, is in a precarious position. It is one of the diving ducks hit hardest by the long drought and one which has been afforded a high degree of protection during the past two hunting seasons. The 1960 redhead population was 72 percent below its already low level of 1959. The canvasback, another diver which the drought hit hard, was down 28 percent from 1959, and a third diver, the ruddy duck, was down 16 percent from 1959. Other species showing decreases were mallards, 22 percent; greenwinged teal, 32 percent; bluewinged teal, 44 percent; and pintails, 27 percent.

### Forests Report 81 1/2 Million Visits

Recreation visits to the national forests hit an all-time high in 1959, causing much heavier use of undeveloped portions of forest where there were no facilities for public use, the U. S. Department of Agriculture announced today.

Reports from Forest Service field offices showed that recreation use has been moving up steadily for the past 15 years as public appreciation of national forest recreational opportunities increased. Visits in 1959 totalled 81,521,000—the biggest gain of any single year since 1946.

### Federation Assigns Man to Southeast

National Wildlife Federation President Claude D. Kelley has announced the appointment of Fielden H. (Pete) Farrar of Atmore, Ala., to the newly-created position of southeastern field representative.

Farrar, 39, is a native Alabamian. He attended Alabama Polytechnic Institute (Auburn), enrolled as an agricultural science student majoring in



Richard F. Brown, Sr. of Washington, D. C., was awarded a trophy by an Arlington sporting goods store for bagging this 16-point, 206-pound whitetail buck in Virginia last season. It was taken in Page County with a .30-'06 Remington automatic.

forestry with courses in wildlife management. After 3 1/2 years in the Air Force during World War II, Farrar became engaged in a business enterprise and dairy farming. More recently he has been employed by the Forestry Division of the Alabama Department of Conservation in public relations and fire investigation work. Farrar will make his headquarters in Atmore. He will serve Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia.

### Nuclear Project "Chariot" Collects Ecological Data

A nuclear shot may or may not be fired in Alaska next year but, regardless of the final outcome, "Project Chariot" will make a unique contribution to the

ecological sciences.

As planned, Project Chariot is an experiment to determine the feasibility of detonating several nuclear devices simultaneously to excavate an area which could be used for a channel and harbor. The project is part of the U. S. Atomic Energy Commission's "Plowshare Program."

Project Chariot already has several "firsts." It would be the first nuclear explosion for peaceful civilian use, prior tests having been for the purpose of military weapons development. As such, it is the first project wherein biological considerations are primary in determining feasibility. It is the first project wherein a complete ecological survey will have been made prior to a nuclear explosion. It is the first instance in the history of the world wherein an entire and exhaustive ecological study of an area has been completed under identical environmental conditions of weather, topography, etc.

### Officers Named for The Wildlife Society

Dr. E. L. Cheatum, assistant director of fish and game, New York Conservation Department, has been elected president of The Wildlife Society for 1960-61, the Wildlife Management Institute reports. Jack H. Berryman, wildlife management specialist, Utah State University, is the Society's new vice-president.

Elected regional representatives for the Society are: Roger Latham, *Pittsburg Press*, Region 1; Leslie L. Glasgow, Louisiana State University, Region 2; Bill T. Crawford, Missouri Conservation Commission, Region 3; Lee E. Yeager, Colorado Cooperative Wildlife Research Unit, Region 4; Wendell G. Swank, Arizona Game and Fish Commission, Region 5; Howard R. Leach, California Department of Fish and Game, Region 6; and David A. Munro, Canadian Wildlife Service, Region 7.





## Game Commission Pilot "Red" Lindsay Murdered March 11

The Virginia game commission's game patrol pilot, Frank E. "Red" Lindsay, was shot in the head and killed on a back road near Norfolk Municipal Airport March 11 by a youth who, according to his own confession, had just murdered and robbed a Norfolk taxi driver.

A favorite friend of everyone who knew him, Red, just 29, had been with the Commission since March 16, 1957. He is survived by his wife and parents, all of whom are Norfolk residents.

A tip from a Norfolk insurance adjuster led police to the arrest of the self-confessed slayer, William Lee Dudley, 21, of Norfolk. Dudley is being held without bail pending Corporate Court grand jury action.

Immediately after the double murder was reported, Governor Almond announced that he would reward \$1,000 for information leading to the apprehending and securing of the person responsible.

This tribute was paid to "Red" by Norfolk Virginian-Pilot outdoor editor Jim Mays on March 13:

"We all called him Red.  
"He was a freckle-faced boy with a tousled shock of flaming red hair, a shy,

an errand of mercy. He radioed the Back Bay game warden headquarters to ask the Norfolk police to send an ambulance. The man in the taxicab had been stricken with a heart attack, he said.

"Are you alone, Red?" asked Game Warden J. A. Saunders over the radio.

"No, there's a man with me," Red replied.

"Those were his last known words. He was found lying in the front seat of his automobile a few minutes later, fatally wounded by a bullet fired by an unknown assailant.

"They'll bury Red Monday and those of us who knew and loved him will weep for the memory of the freckle-faced boy in the familiar blue airplane.

"What he was and what he did are worth remembering.

"More than anything else, it was Red and his blue wings that kept illegal duck trapping under control on the Eastern Shore. Duck traps are easily spotted from the air, and Red took keen delight in swooping across the marshes to spot a trap and bank around to land and smash the trap or tie it on his wings and bring it to Back Bay.



Frank E. "Red" Lindsay



Commission Photo by Cutler

Red and his blue airplane were always near as a pin. Here he helps Fish and Wildlife Service official Poul Quick from his plane to the landing at Back Bay Refuge.

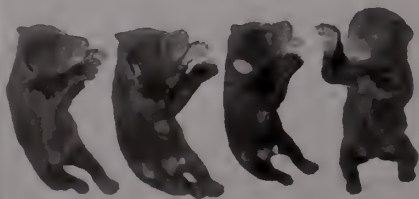
mischievous grin, and twinkling blue eyes that matched the airplane he flew and the skies he patrolled.

"Like the wild things he protected, he sprouted wings early in his life, and used them to protect the other winged creatures he loved.

"But Red isn't with us any more. The name in the obituary column is Francis Edward Lindsay—a strange-sounding, formal kind of a name for the boy we knew as Red.

"It was typical of Red that he stopped to offer assistance Friday when he saw a taxicab in the ditch near the Norfolk airport.

"So, the last act he performed was



On February 19, U. S. Forest Service personnel Gordon Hunter and Tam Glass, while marking timber in Terrapin Creek, Amherst County, jumped a female bear from a depression in the ground and discovered she had left four cubs in the "nest." The men immediately left the area but a check the next day revealed that the female had not returned and that the cubs had died from exposure. The cubs—two males and two females, each about a foot long—had been born shortly before Christmas. Dags may have kept the mother from returning.



Hampton Roads District game wardens were awarded a plaque for having the best non-commercial exhibit at the 7th Annual Walstonian Sparks Show March 11-13 in Norfolk's Municipal Auditorium. The wardens erected and manned an exhibit featuring three panelboard displays, describing the game commission's activities constructed by the commission's audio-visual section, including the one shown above.



"Time after time, the duck trappers sent word to him that the next time they caught him in the marshes they would shoot him, but they never did. It remained for a cowardly assassin who probably didn't even know who he was to do that.

"Those of us who have flown with him remember so many things, little things like the way the stub of a cigar jutted jauntily from one corner of his grin . . . the smudge of grease on the end of his nose when he crawled out of the fuselage of his airplane where he was forever tinkering when he wasn't actually aloft.

"We remember how he fretted when the plane had to be grounded for recovering during duck season last fall, how he melted the ice on the wings with a light bulb on cold mornings, and how he regarded anything about 10 feet over the duck marshes as high-altitude flying.

"We remember teasing him about his navigation, how we used to swear that he navigated on the Eastern Shore by following Route 13 instead of the compass, and how he scared hell out of us when he side-slipped in close to a raft of snow geese so we could take a picture of them rising from the marshes.

"We remember how worried he was about the loss of a game commission

airplane when a violent tornado caught him and his boss, Roland Halstead, and sent them crashing into the sea off Smith Island in 1957, and how he wondered 'whether the commission will ever trust me with an airplane again.'

"Red is lost to us, but the freckle-faced boy with the shy, mischievous grin will live in beloved memory as long as wild ducks fly and a blue airplane protects them."



Under Secretary of the Interior Elmer F. Bennett opens the Bureau of Sport Fisheries and Wildlife's nationwide campaign to promote the after-season sale of the 1959-60 Federal duck stamps to conservation-minded persons. The first three stamps were purchased on February 18 by C. R. Gutermuth, Wildlife Management Institute; Joseph W. Penfold, Izaak Walton League of America; and Stewart M. Brandborg, National Wildlife Federation.

### Waxwing Highway Mortality

James Thornton, supervising biologist, Clemmer Miller, supervising warden, and Max Carpenter, game biologist, enroute to Roanoke on February 28, noticed some birds flutter in front of their car several miles below Steeles Tavern. Several birds dropped on the highway, so they stopped to make identification.

They picked up five freshly killed cedar waxwings and observed where two others had been hit before.

About 200 yards of the center island had been made into a multiflora rose hedge. A large flock of cedar waxwings were in the trees to one side of the highway in a stream bed. The waxwings would fly to the hedge and feed until a car approached, at which time the birds would flutter up and out onto the highway where they were picked off.

### Louisa County Wildlife Food Patch Contest

The morning of February 2, 1960 was the climax of the wildlife food

patch contest among the members of the Louisa County F.F.A. Chapter sponsored by the Louisa Ruritan Club and the Hidden Acres Shooting Preserve.

Seed for the contest was furnished by the game commission, and supervision of seed distribution and planting of the food patches was under the direction of the Louisa High School Vocational Agriculture Department. Approximately 50 boys received seed for planting. Through a process of elimination, the Vocational Agriculture teachers selected the 10 best patches. These were judged in mid-December by Walter Smith, co-partner of Hidden Acres Shooting Preserve, H. T. Payne, game warden, and Howard Sheldon, game biologist. Three winners were invited to shoot on the Hidden Acres Shooting Preserve as guests.

Following a morning of duck shooting, dinner, and an afternoon spent in search of pheasants, Harry McDonald, first place winner, had three ducks and three pheasants; Robert Norton, second place winner, bagged three ducks and two pheasants; and Lloyd Bickley, third place winner, took home two ducks and one pheasant.



Commission Photo by Cutler

On March 18, the game commission received via air express from India 29 young and 48 adult black francalins, game birds native to northern India. Because they are difficult to raise in captivity, the adult birds were released immediately on Hag Island in Surry County (by biologist Herm Tuttle, above), while the young birds were taken by game farm supervisor Dennis Hart to Cumberland for propagation.



A shipment of smallmouth black bass from Virginia, destined to give Swedish anglers a taste of an American fighting fish, is admired by Thomas T. Lenk, president of The Garcia Corporation, and Gate and Leomar Bargstam of Ab Urfabriken, makers of Swedish fishing reels. The Bargstams left for Sweden in March with their six 10-inch bass secured, with the help of the Sport Fishing Institute, from the Virginia game commission's Frant Royal hatchery. The bass are destined for lakes in the central and southern areas of Sweden.





## BUCKINGHAM YOUTHS CONSTRUCT BIRD BOXES

### Game Wardens Sponsor Contest

Teenage boys and girls of Buckingham County have been sawing boards, pounding nails, and drilling holes in bird boxes in an attempt to win the county-wide bird box contest.

Game Wardens Malcolm Booker and C. C. Spencer, sponsors of the contest, will take the winners to the Rock Creek

Assistant County Agent Nick Ptucha, the Westmoreland County youngsters will build the boxes themselves.

### Northumberland Food Patch Contest

The Northumberland County Lions Club is sponsoring a Future Farmers of America wildlife food patch planting contest this spring. State Game Warden Otis Crowther reports that a \$50.00 savings bond will be given to the contest winner.

also showed the 4-H's how the water level is controlled in the refuge by the use of water gates.

Many species of ducks were seen by the Norge youngsters as they drove around the refuge roads. In the late afternoon, deer were spotted by the youths as they were leaving the area.

Trips like this can be taken by any



Commission Photo by Harrison

**Buckingham County Future Farmers of America construct two of the many bird boxes to be made and erected there this spring. Left to right are David Roberts, Charles Stinson, and Linwood Thomas.**

Park Zoo in Washington, D. C., all expenses paid.

Three winners will be selected in the county. The boys or girls that build and erect the highest number of bird boxes will be winners.

The county's 4-H club, Future Farmers of America, and Future Homemakers of America are all taking an active interest in the contest.

Two Buckingham County slate quarries are supplying the slate for the roofs of the houses free of charge.

No doubt about it, Buckingham County birds will have many more nesting sites this summer than ever before.

### Wood Duck Boxes To Be Built

The Westmoreland Ruritan Club of Montross is starting a youth conservation project which includes the construction of about 100 wood duck nesting boxes. Under the guidance of

### Sell Conservation, Make Money

Attention youth groups: Do you want to make some money and sell conservation at the same time? VIRGINIA WILDLIFE magazine makes a special offer to youth groups that are interested in selling subscriptions to this magazine.

Twenty-five cents a subscription is the commission. VIRGINIA WILDLIFE costs \$1.00 per year, \$1.50 for two years, or \$2.00 for three years until this July. The price will go up at that time.

If you are interested, have your advisor write to the circulation section and we will send him receipt books and sample magazines.

Don't wait; sell subscriptions now while VIRGINIA WILDLIFE is still selling at the low prices.

### 4-H's Tour Hog Island

Ducks, geese, a bald eagle, and animal tracks were the highlights of a trip to Hog Island in late February for about 30 boys and girls of the Norge 4-H Club of James City County.

Game Commission Wildlife Education Specialist George H. Harvey and County Agent Mel Bryant led the trip to Hog Island, and Commission Waterfowl Refuge Supervisor Hassel Taylor conducted the tour around the island.

Taylor explained the work being done to raise food for waterfowl at Hog Island and demonstrated some of the equipment used in that work. Taylor



Commission Photo by Harrison

**Norge 4-H Club members look at deer tracks at Hog Island. Here Commission Wildlife Education Specialist George H. Harvey instructs the young 4-H's in how to identify animal tracks.**

interested group, and visitors are always welcome at Hog Island. The fall and winter are best times to see the huge flocks of waterfowl.

In March, the same 4-H Club planted food patches for game birds and mammals in the Norge area. These food patches will produce valuable fruits next fall to help get the game animals through next winter.

There are about 12 boys and girls actively interested in the club's projects and most of them have built bird houses and feeders. All are reported to have fed or watered birds during the freezing weather when snow was on the ground this past winter.

Club leaders assisting the young people are Mrs. A. G. Bradshaw and Mrs. G. B. Anderson of Norge, together with several other parents of club members.





Heaviest black drum landed in Virginia and entered in the 1959 Virginia Salt Water Fishing Tournament weighed 81 pounds.

## Do You Know These Heavyweights?

Pictured on this page are two species of game fish of interest to Virginia saltwater anglers. Both are called drum, both are in a class by themselves as heavyweight fish, yet both have different piscatorial qualities.

The black drum (above), known as *Pogonias cromis*, is a blackish-bluish hued fish with barbels on its lower jaw and is famed for its grunting or drumming sounds during the mating season. It frequents the shallow bottoms of Chesapeake Bay and the Eastern Shore, usually in schools outward from the breakers, feeding on crabs, other crustaceans, and such fish as it can get—dead fish notwithstanding. It is essentially a bottom feeder and a somewhat logy fighter. It has fair eating qualities. Average weights of these fish in our waters are 30-50 pounds although 60 and 70 pounders are not uncommon.

The red drum or channel bass, as he is more popularly called by sport fishermen, goes by the technical name of

*Sciaenops ocellatus* and is truly a game fish of the surf and channel country. More streamlined than its dark-hued cousin, it too has similar feeding and schooling habits—but, once hooked, watch out. The channel bass is a powerful fighter and on the first run will strip off a hundred yards or more of 35-pound test line, making the surfer's reel literally smoke in his hands.

Coppery-brown above, whitish-cream below, the popular channel bass can always be positively identified by the single spots on the tail. Young channel bass ranging from 1-12 pounds are called *puppy drum*. The average channel bass, however, caught from Virginia beaches weighs roughly 35 pounds.

Both fish are members of the croaker family, appear in Virginia waters in late March—the black drum more numerous in April and May, the red more frequent in May or June.

At least five channel bass weighing over 55 pounds were taken in Virginia waters last year.







# The PERCH family



THE WALLEYE HAS WELL-DEVELOPED TEETH...

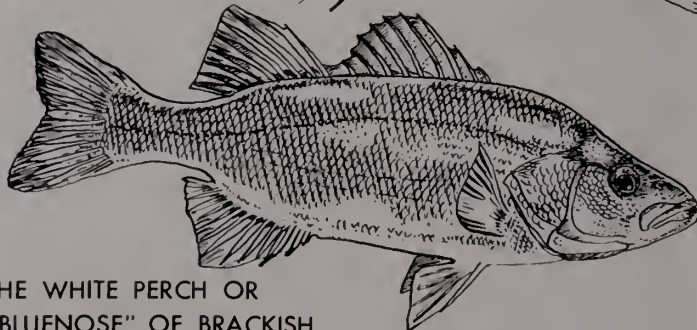


THE YELLOW PERCH, VERY WEAK TEETH.

THE WALLEYE—OR WALLEYED PIKE—IS THE PERCH FAMILY'S LARGEST MEMBER. THE COLDER, CLEAR WATERS OF THE STATE HAVE WALLEYES.



IN THE PAN, THE YELLOW PERCH IS HARD TO BEAT. EGGS ARE LAID IN LONG STRINGS OVER VEGETATION IN SPRING.



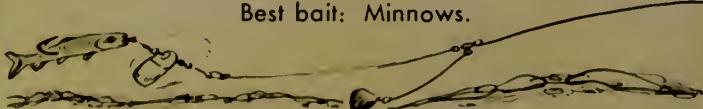
THE WHITE PERCH OR "BLUENOSE" OF BRACKISH WATER IS NOT IN THE PERCH FAMILY (PERCIDAE), BUT ACTUALLY IS A CLOSE RELATIVE OF THE STRIPED BASS!



ALTHOUGH DARTERS ARE TOO SMALL TO ENTER THE CATCH, THEY ARE IMPORTANT TO MANY TROUT AND SMALLMOUTH STREAMS. GAME FISH FEED ON THEM.

## PERCH FAMILY FISHING TIPS:

WALLEYES: Fish at night in rocky-bottomed water  
Best bait: Minnows.



YELLOW PERCH: Find the schools by drifting. Use small minnows.

